

International Conference on Medicinal Chemistry

44^{èmes}

RICT

RENCONTRES INTERNATIONALES DE
CHIMIE THERAPEUTIQUE

Organisées par la Société de Chimie Thérapeutique (SCT)



Interfacing Chemical Biology, Natural Products and Drug Discovery

July 2 - 4, 2008

Faculty of Pharmacy - Angers, France

www.medchem.fr

ALMOND AND CHESTNUT BY-PRODUCTS AS NEW NATURAL SOURCES OF HEALTHY BIOACTIVE COMPOUNDS

João C.M. Barreira¹, Isabel C.F.R. Ferreira^{1,*}, M. Beatriz P.P. Oliveira², José Alberto Pereira¹

¹ CIMO/ESA, Instituto Politécnico de Bragança, Campus de Santa Apolónia, Apartado 1172, 5301-855 Bragança, Portugal.

² REQUIMTE/Serviço de Bromatologia, Faculdade de Farmácia da Universidade do Porto, Rua Aníbal Cunha, 164, 4099-030 Porto, Portugal.

*Tel +351-273 303219; Fax +351-273 325 405; e-mail: iferreira@ipb.pt

Disruption of the balance between reactive oxygen species (ROS) production and elimination leads to oxidative stress. As a consequence, ROS are known to be implicated in many cell disorders and in the development of many diseases including cardiovascular diseases, cancer, atherosclerosis, cataracts, chronic inflammation, or neurodegenerative diseases.¹ To find new natural sources of bioactive compounds, the antioxidant properties of almond green barks, chestnut skins (inner and outer) and chestnut leaves, were evaluated through several chemical and biochemical assays: DPPH (2,2-diphenyl-1-picrylhydrazyl) radical scavenging activity, reducing power, inhibition of β -carotene bleaching, inhibition of oxidative hemolysis in erythrocytes, induced by 2,2'-azobis(2-amidinopropane)di-hydrochloride (AAPH), and inhibition of lipid peroxidation in pig brain tissue through formation of thiobarbituric acid reactive substances (TBARS). Our research group had already studied extensively these assays as models for the peroxidative damage in biomembranes.² However, few studies reporting the indicated chestnut and almond by-products antioxidant potential are available. This could be a valuable development strategy, once Trás-os-Montes region represents about 82% of Portuguese chestnut production. Similarly, this region is responsible for 87% of the almond produced countrywide. Hence, the evaluation of such properties is an interesting and valuable task, particularly to find new sources for natural antioxidants, functional foods or nutraceuticals. In this work, the EC₅₀ values were calculated for all the methods in order to evaluate the antioxidant efficiency of each product. The obtained results revealed great antioxidant properties (EC₅₀ values ranging from 30 to 500 μ g/ml). The phenol and flavonoid contents (200-800 mg of gallic acid equivalents/g of extract and 20-200 mg of (+)-catechin equivalents/g of extract) proved to be correlated to antioxidant activity.

Acknowledgements

The authors are grateful to Foundation for Science and Technology (Portugal) for financial support to J.C.M. Barreira (SFRH/BD/29060/2006) and INTERREG IIIA project PIREFI.

References

1. Halliwell B. Antioxidants in human health and disease. *Annu. Rev. Nutr.* 1996, 16, 33-50.
2. Barreira, J.C.M.; Ferreira, I.C.F.R.; Oliveira, M.B.P.P.; Pereira, J.A. Radical scavenging effects, hemolysis and lipid peroxidation inhibition capacity of chestnut constituents: Flower, Leaf, Skins and Fruit, *Food Chem.* 2008, 107, 1106-1113.